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✧ The Shelf Life of Green Peas in Retail Store Display Cases ✧

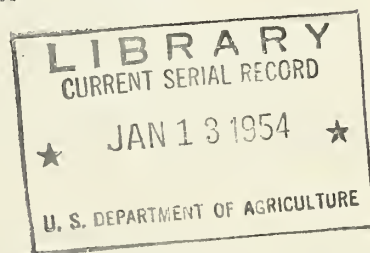
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The Shelf Life of Green Peas in Retail Store Display Cases

Introduction

The purpose of this study was to determine the effects of various retail store handling practices upon the quality and condition of green pod peas. Two tests were made in April and May 1952 in a laboratory at Beltsville, Md., equipped to simulate several different retail store display practices.

Operation of the Display Room

The peas were obtained in original containers from the Washington, D. C. wholesale produce market and were labeled to indicate that they were grown in California. They were displayed for 3 days as follows:

1. In a non-refrigerated case continuously.
2. In a non-refrigerated case during the daytime and stored in 32° and 40° F. "walk-in coolers" at night.
3. In a mechanically refrigerated case (convection type) on a false bottom and regular rack.
4. In an ice bed case.

A 6-foot wood display case with galvanized metal bottom and sides was used for non-refrigerated display. It was provided with a slatted rack, sloping towards the front. The distance from the front to the back of the case was 30 inches.

A 10-foot commercial, mechanically refrigerated case (convection type) was used for the refrigerated display.

A 5-foot commercial insulated ice bed case was the third type of case used.

The display cases were in a room on the ground floor of a well insulated brick building.

Storage rooms held at 32° and 40° F. were used for night storage of the peas displayed during the daytime in the non-refrigerated case. Temperatures in the rooms were thermostatically controlled, and small fans were used to circulate the air. The relative humidity was kept at approximately 85 per-cent.

The peas displayed in the mechanically refrigerated case and in the ice bed case were held in these cases night and day throughout the entire tests except for the time necessary each day to weigh and examine them for changes that may have occurred during the previous 24-hour period. The peas in the

cases were covered with heavy kraft paper at night. Some peas were not refrigerated at any time and remained in the non-refrigerated case throughout the tests. Other lots of peas displayed in the non-refrigerated case during the daytime were stored at night in the "walk-in coolers" at 32° or 40° F.

In each of the mechanically refrigerated and non-refrigerated cases, one lot of peas was sprinkled with water several times daily and a duplicate lot was not sprinkled at any time. The non-sprinkled peas that had been held overnight in refrigerated storages became wet from condensed moisture when they were returned to the non-refrigerated rack each morning.

In the ice bed case, the peas were arranged on a bed of crushed ice which had been spread over the bottom of the case 3 to 5 inches deep. The ice bed was replenished once each day. One lot of peas was garnished with a thin layer of crushed ice each morning; and again at noon and mid-afternoon. Two lots were iced only at night when the peas were prepared for night storage; one of these lots was sprinkled during the day and the other was not sprinkled but the peas had become wet in the morning from ice that melted during the night. At six o'clock at night a thick layer of ice was spread over the peas in all lots in the ice bed case and they were then covered with heavy kraft paper.

The display period began between 8:00 A.M. and 9:00 A.M. and ended between 6:00 P.M. and 7:00 P.M.

The average daytime display room air temperature during the test period was 76° F.

Temperatures were obtained with fruit thermometers and thermocouples inserted into peas located at the same relative positions on each of the display racks.

Decayed and defective peas were discarded and the remainder sorted into representative samples before they were arranged on the various racks at the start of the tests. The peas were displayed 6 to 7 inches deep extending from the front to the back of each rack. There were 8 to 9 pounds of peas in each lot.

The peas were weighed once each day to determine moisture loss or gain and examined for wilting, drying, aging, and decay.

Results

The peas deteriorated rapidly under all handling practices. Those that were sprinkled or wet from ice garnish developed more decay than the peas that were kept dry (fig. 1). Even refrigerated peas showed more decay in the sprinkled lots than in the non-sprinkled. However, the decay was usually in the

form of small watery spots which affected the pods only; the spots were often inconspicuous under all handling practices. At the end of the 2nd day the peas that had not been sprinkled or iced became severely wilted with some having a dried or aged appearance that was more unsightly than those with decay in an early stage of development. Most wilting occurred in the upper part of the displays.

After 2 days, the peas displayed on the regular rack in the mechanically refrigerated case and those in the ice bed case had the lowest percentage of total effects and were in the best condition. At the end of 3 days, the peas under all methods of handling showed 15 percent or more total defects, with the non-sprinkled lot displayed continuously without refrigeration showing the highest percentage, 45.4 percent.

The non-sprinkled peas not only had the highest percentages of total defects but also showed considerably greater weight losses than the peas that were sprinkled (fig. 2). Non-sprinkled peas that were displayed continuously without refrigeration showed the greatest weight loss with 7, 12, and 18 percent at the end of the 1st, 2nd, and 3rd days, respectively, of the tests. Sprinkled peas in the mechanically refrigerated case, and the garnished, sprinkled, and non-sprinkled lots in the ice bed case showed small gains in weight each day of the test. The increase in weight of the non-sprinkled peas in the ice bed case probably was due to absorption of moisture from the melting ice with which they had been covered each night.

At the end of the 3-day test, a panel consisting of members of the staff scored the appearance of the various lots of peas and reported the results shown below. Ratings were based upon a scale of 1 to 10 points, with 1 indicative of the poorest appearance and 10 the best.

	<u>Avg. Score</u>
A-Non-refrigerated continuously-Not sprinkled	2.2
B- " " " -Sprinkled	4.8
C- " " days-32° F. nights-Not sprinkled	4.8
D- " " " " " -Sprinkled	6.5
E- " " " -40° " -Not sprinkled	6.0
F- " " " " " -Sprinkled	6.8
G-False rack, mechanically refrigerated case-Not sprinkled	6.8
H- " " " " " -Sprinkled	6.8
I-Regular rack, " " " -Not sprinkled	7.0
J- " " " " " -Sprinkled	8.8
K-Ice bed case-garnished with ice daily-Iced nights	10.0
L- " " " -not garnished or sprinkled days-Iced nights	10.0
M- " " " -sprinkled days-Iced nights	10.0

Sprinkling with tap water or garnishing with ice was beneficial to the peas in practically all lots and was not harmful under any of the various handling practices.

Conclusions and Suggestions for Retail Store Operators

Severe wilting, drying, aging, or decay developed rapidly under each type of handling practices.

Small decay spots which increased more rapidly on peas in sprinkled or iced lots were less objectionable than severely wilted, dried, or aged pods that occurred in lots that were kept dry. Light sprinkling with water several times daily is recommended.

The highest percentage of total defects developed in peas that were not sprinkled in the non-refrigerated case.

Peas held at the lower temperatures showed the lowest percentage of total objectionable defects. Refrigerated peas will have a more attractive appearance and will also have the most acceptable eating quality.

Peas displayed without refrigeration during the daytime should be stored at night in iced produce barrels or in cold rooms with high humidity. When held overnight in cold rooms, the addition of ice over the peas would be beneficial.

These tests indicate that the shelf life of green pod peas is very short and that they should be moved into consumption as quickly as possible if desirable quality is to be offered to the consumer and excessive losses avoided.

Fig. 1. Condition of Green Peas as Affected by Various Handling Practices in Retail Store Display Cases

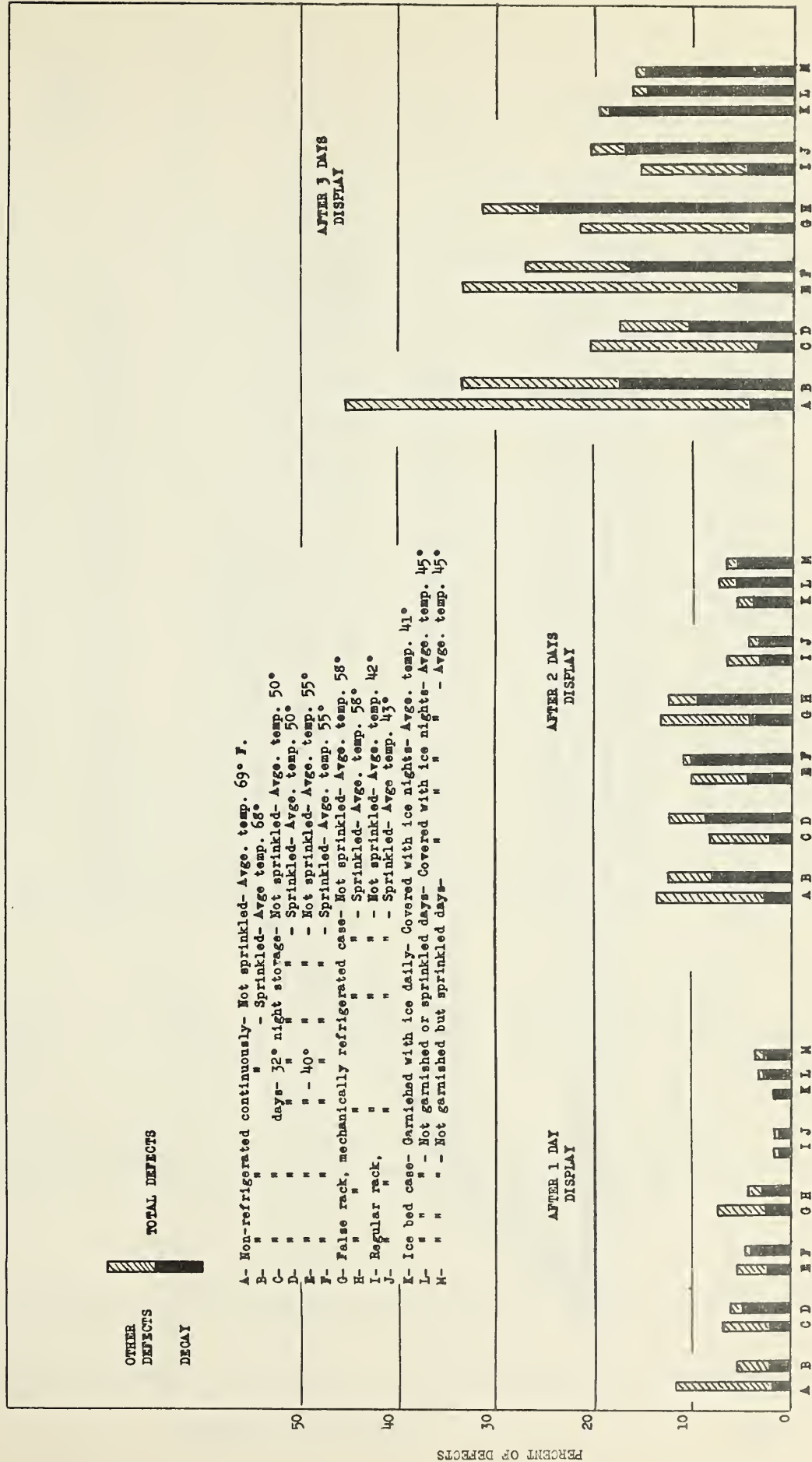


Fig. 2. Weight Changes in Green Peas as Affected by Various Handling Practices in Retail Store Display Cases.

